

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Space Exploration Holdings, LLC	)	IBFS File No. SAT-MOD-20181108-00083
	)	Call Signs S2983 and S3018
Application For Modification of	)	
Authorization for the SpaceX NGSO	)	
Satellite System	)	

**COMMENTS OF SES AMERICOM, INC. AND O3B LIMITED**

SES Americom, Inc. and its affiliate O3b Limited (collectively, “SES”), hereby comment on the above-captioned application by Space Exploration Holdings, LLC (“SpaceX”) to modify its license to operate a system of non-geostationary orbit (“NGSO”) satellites in Ku- and Ka-band spectrum.<sup>1</sup> SES has a strong interest in the Modification, as SES entities operate both NGSO and geostationary orbit (“GSO”) networks that use these bands.

Prior to further considering the Modification, the Commission must require SpaceX to demonstrate that the Modification will not increase the potential for harmful interference to other NGSO systems, including the operating O3b NGSO constellation and its authorized expansion. Absent such a showing, the SpaceX request for consideration of the Modification without triggering a new processing round must be rejected.<sup>2</sup> In addition, any grant of the Modification must be conditioned to require SpaceX to comply with applicable International Telecommunication Union (“ITU”) requirements necessary to protect GSO FSS networks in Ku- and Ka-band frequencies.

---

<sup>1</sup> See *Space Exploration Holdings, LLC*, File No. SAT-MOD-20181108-00083 (the “Modification”); *Space Exploration Holdings, LLC*, 33 FCC Rcd 148 (2018) (the “SpaceX Authorization”).

<sup>2</sup> Modification, Waiver Requests at 1-2.

## **I. SPACEX MUST SHOW THAT THE MODIFICATION DOES NOT INCREASE THE RISK OF INTERFERENCE TO OTHER NGSO SYSTEMS**

Before it can determine whether the Modification is eligible for action outside a processing round, as SpaceX requests, the Commission must require SpaceX to submit a supplemental showing that the changes it proposes do not increase the potential for harmful interference to existing and planned NGSO constellations that were timely filed in the recent Ku/Ka-band processing round. SpaceX explicitly recognizes this requirement, citing Commission rules and precedent that allow a modification to an authorized NGSO system to be handled without initiating a new processing round only if no significant interference problems are created by the requested changes.<sup>3</sup> As the Commission has emphasized, NGSO processing rounds serve “to establish a sharing environment among NGSO systems, to provide a measure of certainty in lieu of adopting an open-ended requirement to accommodate all future applicants.”<sup>4</sup> Permitting SpaceX to modify its license without a robust interference analysis would directly conflict with these objectives, casting doubt on the Commission’s willingness to protect NGSO systems authorized for Ku- and Ka-band operations

SpaceX asserts that the Modification will not raise interference issues for other NGSO networks, but its showing on this point is patently inadequate. In the Modification, SpaceX proposes a number of changes to its Ku-/Ka-band NGSO constellation, including decreasing the number of orbital planes from 32 to 24, increasing the number of satellites per plane from 50 to 66, decreasing the total number of satellites in the constellation from 4,425 to

---

<sup>3</sup> *Id.* at 1-2 & nn.4-9.

<sup>4</sup> *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 7809, 7830, ¶ 61 (2017).

4,409, and lowering the altitude of the initial portion of the constellation from 1,150 kilometers to 550 kilometers. In the technical materials filed with the application, SpaceX claims that the changes “will not increase interference to any other NGSO system operating in the bands used by SpaceX satellites.”<sup>5</sup> But SpaceX presents an analysis only with respect to a single Intersputnik ITU filing<sup>6</sup> – SpaceX does not address the in-orbit O3b Ka-band NGSO network, the Commission-sanctioned expansion of O3b’s system, or any of the eleven other NGSO constellations proposed in the Ku-/Ka-band processing round, many of which have also been authorized.

The parameters of the network described in the Intersputnik ITU filing, including the network’s orbital configuration and space and earth station receive characteristics, are not representative of any of the other filed constellations in the Ku-/Ka-band NGSO processing round. Moreover, the data provided by SpaceX in Figures A.8.2-1 through A.8.2-4 do not clearly show the effects this Modification would have on other NGSO systems. For example, there appear to be discontinuities in the cumulative distribution function (“CDF”) curves representing the authorized SpaceX constellation of 4,425 satellites that make it difficult to understand and interpret the results in those graphs.<sup>7</sup> In order to adequately demonstrate the impact of the changes proposed in the Modification on other NGSO constellations, SpaceX must provide CDF curves that clearly indicate whether the Modification increases or decreases the likelihood of interference into victim NGSO systems.

---

<sup>5</sup> Modification, Attachment A at 24.

<sup>6</sup> *See id.*, Section A.8.2, at 24 (“SpaceX used the characteristics of the IK-NGSO-A10K-1 network filed with the ITU” to “assess the potential impact of the modification on an NGSO system operating in the Ku-band”), 34 (same with respect to Ka-band).

<sup>7</sup> *See id.* at 27-29.

The analysis also fails to reflect the planned phased deployment of the SpaceX constellation. The only comparison SpaceX provides is between the originally authorized network of 4,425 satellites and the revised constellation of 4,409 spacecraft. But SpaceX has explained that it plans to deploy an initial “shell” of satellites capable of operating as a standalone constellation and has argued that the Commission should require only those spacecraft to be deployed within the six-year NGSO operating milestone, with no deadline to launch and operate the remainder of the network.<sup>8</sup> Although the Commission declined to grant SpaceX’s milestone waiver request, it left open the possibility that SpaceX could reapply at a later date.<sup>9</sup> Given SpaceX’s stated intention to rely on the first shell of satellites for a potentially significant period of time and the substantial change in altitude for that shell proposed in the Modification, SpaceX should be required to provide an analysis comparing the interference effect of the Modification taking into account only the initial deployment – 1,584 satellites at 550 kilometers as opposed to 1,600 satellites at 1150 kilometers under the original SpaceX proposal. This showing is necessary to allow NGSO operators to understand the impact of the Modification during the potentially lengthy period when only the initial shell of the SpaceX constellation will be in place.

In short, the limited SpaceX technical analysis does not support the broad claim that no other NGSO system will experience increased interference as a result of the changes sought in the Modification. Before the Commission can determine whether to consider the Modification outside a processing round, it must require SpaceX to submit a supplemental interference showing that demonstrates the Modification will not increase the potential for

---

<sup>8</sup> See SpaceX Authorization at ¶ 31.

<sup>9</sup> See *id.* at ¶ 32.

harmful interference to O3b's existing and planned medium earth orbit constellation, as well as the other Ku-/Ka-band NGSO processing round constellations. Absent such a showing, the Commission must deny SpaceX's request for a waiver of Section 25.157 and must consider the Modification only as part of a new Ku-/Ka-band NGSO processing round.

## **II. THE COMMISSION MUST REQUIRE SPACEX TO COMPLY WITH ITU REQUIREMENTS FOR PROTECTING GSO SYSTEMS**

The Commission must also require SpaceX to comply with equivalent power flux-density ("EPFD") limits set forth in Article 22 of the ITU Radio Regulations, which are designed to ensure operations of GSO FSS systems in Ku- and Ka-band spectrum are protected. In the Modification, SpaceX seeks a waiver of the requirement specified in both the Commission's rules and the SpaceX Authorization<sup>10</sup> that before it initiates service, SpaceX must receive a "favorable" or "qualified favorable" finding with respect to its compliance with these EPFD limits.<sup>11</sup> SpaceX argues that an ITU backlog makes it unlikely that a finding would be issued prior to the time SpaceX would be ready to begin operations, and adhering to the condition would therefore delay SpaceX's ability to begin serving customers.<sup>12</sup>

SES takes no position on the SpaceX request provided that any waiver grant addresses only the timing of the ITU finding and is conferred at SpaceX's own risk. SpaceX's license must still be conditioned on the need to obtain the required ITU finding. Moreover, the Commission must specify that if SpaceX commences service before the ITU issues a finding, SpaceX would be obligated to cease operations in the event the ultimate finding by the ITU is unfavorable.

---

<sup>10</sup> See 47 C.F.R. § 25.146(c); SpaceX Authorization at ¶ 9.

<sup>11</sup> Modification, Waiver Requests at 3-4.

<sup>12</sup> *Id.*

### III. CONCLUSION

For the foregoing reasons, unless SpaceX provides a supplemental demonstration that its modified operations do not increase the potential for harmful interference to O3b and other participants in the Ku/Ka-band NGSO processing round, the Commission must defer consideration of the Modification to a subsequent round. The Commission must also require SpaceX to comply with ITU EPFD requirements designed to protect GSO systems.

Respectfully submitted,

**SES AMERICOM, INC. AND O3B LIMITED**

/s/ Petra A. Vorwig

Senior Legal and Regulatory Counsel  
SES Americom, Inc.  
1129 20th Street, NW, Suite 1000  
Washington, DC 20036  
(202) 478-7143

Of Counsel

Karis A. Hastings  
SatCom Law LLC  
1317 F Street, N.W., Suite 400  
Washington, D.C. 20004  
[karis@satcomlaw.com](mailto:karis@satcomlaw.com)

/s/ Suzanne Malloy

Vice President, Regulatory Affairs  
O3b Limited  
1129 20th Street, NW, Suite 1000  
Washington, DC 20036  
(202) 813-4026

Noah Cherry

Legal and Regulatory Counsel  
O3b Limited  
1129 20th Street, NW, Suite 1000  
Washington, DC 20036

February 8, 2019

## CERTIFICATE OF SERVICE

I hereby certify that on this 29th day of January 2019, I caused to be served a true copy of the foregoing “Comments of SES Americom, Inc. and O3b Limited” by first class mail, postage prepaid, upon the following:

William Wiltshire  
Paul Caritj  
Harris, Wiltshire & Grannis LLP  
1919 M Street, N.W., Suite 800  
Washington, DC 20036  
Counsel to Space Exploration Holdings, LLC

Tim Hughes  
Senior Vice President, Global Business and  
Government Affairs  
Patricia Cooper  
Vice President of Satellite Government Affairs  
Space Exploration Technologies Corp.  
1155 F Street, NW, Suite 475  
Washington, DC 20004

/s/  
\_\_\_\_\_  
Noah Cherry